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**AUSTRALIAN MILITARY FORCES**

**SMALL ARMS TRAINING**

**VOLUME 1, PAMPHLET No. 2**

**APPLICATION OF FIRE**

**1945**

(This pamphlet supersedes all previous editions.)

Prepared by the General Staff and issued under the direction of the Commander-in-Chief, Headquarters, Australian Military Forces.

By Authority: Victorian Railways Printing Works, North Melbourne.

77-45



S. A. T. Volume 1, Pamphlet No. 2

# APPLICATION OF FIRE

1945

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## AMENDMENTS

## GENERAL

### Object.

1. The sole object of weapon training is to teach all ranks the most efficient way of handling weapons in order to kill the enemy. Instructors will always bear this fact in mind and will continually impress it upon those whom they instruct.

### Requirements for Effective Fire.

2. (a) Fire unit commanders must have the tactical knowledge to select the targets and the best moment for opening fire. They must be able to indicate targets clearly.
- (b) Those under their command should be able to recognize the targets.
- (c) All ranks must be trained to judge distance.
- (d) Good fire discipline must be combined with intelligent fire control.
- (e) Accurate shooting.

### Control of Fire Power of Section.

3. The section commander is responsible for fire control of the section. Fire may be concentrated or distributed according to the type of target. **The value of holding fire in order to obtain maximum surprise as well as to ensure killing the enemy must be emphasised in all fire-control lessons.**

4. The light machine gun is the principal fire-producing weapon of the section. The rifle is not only the personal weapon of the rifleman, for use in an emergency or for augmenting the fire of the light machine gun, it also enables the rifleman, by accurate shooting, to "snipe" individual enemy. The section commander normally carries the sub-machine gun, but may nominate someone else to do so. The sub-machine gun is not a light machine gun.

5. **Collective fire** is the term used to denote the fire of the section under the control of its commander. The method of firing the light machine-gun is by single rounds or bursts but, owing to the heavy expenditure of ammunition that continuous automatic fire will entail and since the amount carried is limited, single round firing will be used unless the target calls for volume.



6. **Individual fire** may be allowed, on the orders of the section commander when, on account of battle conditions, the best advantage can be obtained by each man firing individually.

#### Other Aspects of Use of Fire.

7. Fire has more purposes than to kill. With ingenuity it can be used to obtain information or for signalling.

8. It is frequently difficult to spot the location of enemy weapons. Judicious opening of fire by one of our LMGs or mortars will often serve to draw fire from, and thereby disclose, enemy weapons. It will be realised, however, that the enemy is likely to adopt similar tactics in order to locate our weapon dispositions.

#### Realism in Training Instruction for Trained Soldiers.

9. (a) Whenever possible fatiguemen should be used instead of figure targets.

(b) Where safety arrangements are adequate the use of ball ammunition, in lieu of blank, will ensure greater realism. It must, however, be carefully controlled. Selected firers, using correctly zeroed weapons and operating under detailed and clear instructions, will be used. (See SAT Vol 1, Pamphlet No. 1-1944, for complete instructions on this aspect.)

#### Recruit Instruction.

10. Although in battle the requirements set forth in para 2 above are interdependent, in the early stages of training each subject will be taught separately. Lessons in this pamphlet should be given on rough ground, but in exceptional circumstances landscape targets may be used, except for judging distance.

11. Instructors must appreciate that, whilst the lessons are as set out, this does not always imply that the lesson will be covered in one instructional period. Certain lessons, e.g., 1 and 7, will require two periods to cover the subject effectively. Other periods will be necessary for all lessons, to obtain the required efficiency.

12. Instruction in indication and in production of fire control orders will not be given to private soldiers, unless they are being trained as potential NCOs. Private soldiers will be thoroughly trained in recognition and in the application of fire control orders given to them by their leaders.

#### Trained Soldier Instruction.

13. The trained soldier must be specially exercised in locating indistinct enemy targets and in judging distance. He must continually be practised in applying his fire accurately when targets are indicated to him by a section commander. He also should be taught the theory of small arms fire (Chapter 2, SAT Vol 1, Pamphlet No. 1) so that he can take an intelligent interest in fire control. Finally, the trained soldier will get the maximum benefit from training in fire control through simple battle practices, field exercises or through the use of harmonized sights on the 30 yards or miniature ranges.

#### Method of Fire with LMG.

14. The gunner will invariably fire single rounds unless the fire order includes the word "bursts". The reasons for this are:—

- (a) Ammunition is saved.
- (b) There is less chance of the LMG being spotted.
- (c) Fire tends to be more accurate than when bursts are fired.

15. Personnel equipped with field glasses must be exercised in their use. The importance of this form of training cannot be over-emphasized.

#### Military Vocabulary.

The following is a specimen vocabulary, subjoined as a guide to instructors. This should be taught, as occasions arise in various lessons. It should be amplified by teaching local names of features that are peculiar to the country in which the soldier is serving.

##### (a) Artificial Features.

Track	Post-and-rail fence	Viaduct
Ride	Hurdle fence	Culvert
Sunken roads	Pylon	Cutting
Ford	Ricks	Embankment
Gable-end	Stooks	Lock

##### (b) Natural Features.

Trees {	Gum	Stumps	Hedge
	Pine	Logs	Gorse
	Bushy-topped	Tussocks	Bracken

##### (c) Topographical.

Ridge	Ravine	Clearing
Valley	Saddle	Salient
Fold	Crest-line	Deadground
Defile	Horizon	Forward slope
Spur	Foreground	Reverse „
Knoll	Middle distance	Concave „
Cliff	Background	Convex „
Gorge		

##### (d) Field Engineering.

Slit trench	Observation post
Breastwork	Emplacements
Defended locality	Parapet and Parados

##### (e) Types of Fire.

Direct	Flanking
Indirect	Enfilade
Frontal	Overhead



# Chapter I.

## VISUAL TRAINING

### GENERAL.

#### Object.—

1. To develop powers of observation and deduction.
2. Modern weapons, open formation, the art of making the best use of cover, camouflaged uniforms and artificial aids to concealment have reduced the visibility of the enemy. Visual training is, therefore, of the utmost importance in order that the enemy shall not remain undiscovered.
3. Periods allotted to visual training will have little value unless the instructor has enthusiasm and can, by his prior arrangements for the lesson and instructional manner during it, arouse the imagination and interest of students. He should ensure that personnel appreciate the influence of visual training on the later training of the soldier, e.g., fieldcraft, map reading, etc.

### LESSON 1. SEARCHING GROUND AND LOCATING ENEMY.

#### INSTRUCTOR'S NOTES.

##### Stores.—

*Figure targets Nos. 2, 3, 4 and 5; aiming rest or pointer staff; fatiguemen armed with rifles and blank SAA; signal flags (as required).*

*Personnel equipped with field glasses should be trained in their use in this lesson.*

*This lesson requires careful preparation and rehearsal shortly before it is due to take place, otherwise a sudden change of light may well spoil the lesson. It will be carried out in two phases; first—with figure targets; second—with fatiguemen.*

*Select an area with well-defined boundaries and put out the targets in the foreground, middle distance and background. They should be so placed, having due regard to colour of target and its background, that some are easy and other difficult to locate. Light and shade must also be carefully noted.*

*When searching ground, even in the early stages, instructors must make students adopt proper positions of observation.*

*It will not be possible to complete this lesson in one period. After paragraphs 2, 3 and 4 have been taught and practised they should be applied in conjunction with paragraphs 5, 6 and 7, which should be carried out as separate phases.*

#### Object.—

1. The object of this lesson is to teach how to search ground and to locate enemy.

#### Arcs of Fire (Defence).—

2. (a) Explain that arcs of fire are allotted to sections. The area of ground within the limits of the arc is the responsibility of the section, and it will engage all targets appearing within those limits. The general line of direction and the arc of fire will be pointed out. They will be described by indicating landmarks (the fewer the better), starting on the right background and finishing in the foreground. Repeat for left of arc.
- (b) Explain.—
  - (i) Right, centre and left of arc.
  - (ii) How to divide the area into foreground, middle distance and background.
- (c) Test recognition of above divisions. Instructor lays an aim (using a rifle or pointer staff) on a specific object. Recruit views aim and indicates its location, e.g., "Right of arc, foreground".

#### Searching Ground.—

3. The method is to examine the ground systematically along imaginary lines from right to left, through foreground, middle distance and background. The eye should travel along one line and return by the next, to ensure that no part of the area is omitted.

4. Practise members of the squad in describing natural objects within the arc (indicated by rifle or pointer staff), instructor correcting military vocabulary terms employed. The depth of the area to be searched should not usually exceed 1000 yards; in initial stages—not more than 800 yards.

#### Locating Targets.—

5. (a) Describe arc to be searched.
- (b) Practise squad in searching foreground. After a given time men are selected to describe the targets they have found. The instructor will then criticise the description and explain why some targets were more difficult to locate than others, because of the variation in colour between targets and their backgrounds.
- (c) Repeat procedure for middle distance and background.



### **Fatiguemen.—**

6. This phase is carried out as above. Fatiguemen should be placed in firing positions in the open, in relation to cover or shadow and at relatively close ranges.

7. Certain fatiguemen should be instructed to make cautious movements associated with firing and reloading the rifle, on a specific signal. Others, to simulate the actions of an incautious enemy, should be instructed to make body and weapon movements on a further signal. Remainder to fire blank rounds on an arranged signal, care being taken to ensure that rifle barrels are entirely free from oil. Emphasize how movement catches the eye and that the noise of firing assists in locating the position of the enemy.

- NOTES.—**
1. Fatiguemen should not be "hidden". Whether placed in the open or in relation to cover, they must be so placed as to be able to see distinctly the squad under instruction and, in turn, be liable to be seen by those members of the squad possessing the attributes necessary, i.e., good vision, sound method and deductive reasoning capacity.
  2. Fatiguemen, representing other phases of enemy activity, can be introduced into the later stage of the lesson and equipped to produce certain effects, e.g., rangetaker (appearance of instrument), rifle bomber (weapon and movement), reconnaissance personnel (use of binoculars, maps, or note-books), etc.
  3. As a final stage of training, NCOs and men should be split into two halves—one half to do section handling. This party should advance against the remainder, who are occupying a platoon defended locality. Thus the latter are practised in observation and the former in section handling. Live ammunition may be introduced (see General, paragraph 9 (b)).

## *Chapter II.*

# *JUDGING DISTANCE*

### **GENERAL.**

#### **Object.—**

1. To teach the soldier to estimate the range to the enemy correctly, thereby ensuring that, if his shooting is accurate, he will kill the enemy without wasting ammunition.

#### **Means.—**

2. There are three means of obtaining ranges:—

- (a) **Judging Distance.**—All ranks will receive training in the estimation of range by the eye which is the most common means. Skill is acquired by constant practice under varying conditions of ground, light and background. Local conditions of light and background must be studied and advantage taken of every opportunity to practise, in order to maintain a high standard. Whenever possible, the range estimated by the eye should be checked by ranges taken by a rangetaker.
- (b) **Range-finders.**
- (c) **Large-scale Maps.**

3. This chapter deals only with training in methods of judging distance.

#### **Observation of Fire.—**

4. It is the duty of the section commander to observe the fire of his section in order that he can correct its application if necessary. The possibilities of observing fire will depend on the nature of the ground surrounding the target. Should the fall of bullets be observed both short of and beyond the target it may be assumed that the target is coming under the fire of the section. Observation of fire must be at all times applied.

#### **Ranging.—**

5. Should the situation permit, ranges to objects within the arcs of fire may be accurately checked by fire, provided that neighbouring ground allows the strike of bullets to be observed.



### Limits of Training.—

6. (a) All ranks will be trained to judge distances up to 1,000 yards.
- (b) Officers, WOs and NCOs and selected privates of MMG units will, in addition, be trained to estimate distance from a key range, up to 2,000 yards.
7. All ranks will be practised in judging distance from suitable firing positions behind cover.

## LESSON 2. UNIT OF MEASURE.

### INSTRUCTOR'S NOTES

#### Stores.—

*Four flags placed in position 100 yards from a central point in different directions. Flags will be so placed that the student must look uphill and downhill, across open ground, into the sun, etc. Signal flag; 100 yard measuring tape; small flags; fatiguemen.*

*Distances will be measured accurately in preparing this lesson.*

#### 1. Explain.—

- (a) Main points of Chapter II, paras 1 and 2 (a).
- (b) Unit of measure, i.e., a method of measuring distance in terms of some familiar unit (e.g. 100 yards).

2. Direct squad to look at flags in position, kneeling and lying, and memorize distance of 100 yards.

3. Order men to place themselves independently at what they judge to be 100 yards from a named object. Pace or measure 100 yards from it, show men correct distance and their amount of error. Repeat against other objects under different conditions of light, direction and ground, until general error is reduced.

4. Practise squad in judging distance to objects up to 400 yards from their position.

5. To emphasize the unit of measure, each 100 yards between squad and object flag will be marked by small flags previously laid on the ground and invisible to those under instruction. The soldier having estimated the distance, will be questioned how he has fitted in the number of "units". The small flags will then be put up and the difficulty of fitting in "units," as the distance increases, pointed out.

#### 6. Emphasize the following limitations:—

Method is of little value for distances beyond approx. 400 yards owing to difficulty in fitting in successive "units". It cannot be employed when ground between observer and object to be judged is not visible.

## LESSON 3. THE APPEARANCE METHOD.

### INSTRUCTOR'S NOTES.

#### Stores.—

#### Signal flag.

*This lesson can, with advantage, be carried out on a classification range, using firing point distances. If this arrangement is not possible, distances to be judged must be measured accurately.*

*Six fatiguemen with rifles are required and must be rehearsed.*

1. Explain that the detailed appearance of men in different service positions, and of objects of known size, will be studied and noted at various distances and under varying conditions of light and background. This method of judging distance is both simple and quick, being suited to service conditions.

2. Signal fatiguemen to appear in turn at distances from 200 to 600 yards, lying, kneeling and standing at each distance. Later a fatiguer should appear kneeling at 250 yards.

3. Order men to observe the appearance of fatiguemen at various distances and in various positions. As a guide the following should be noted:—

- (a) At 200 yards—all parts of the body can be seen distinctly.
- (b) At 300 yards—outline of face becomes blurred.
- (c) At 400 yards—outline of body remains but face cannot be seen except in favourable circumstances.
- (d) At 500 yards—body appears to taper slightly from shoulders. Movements of limbs are still discernible.
- (e) At 600 yards—head appears as a dot, details not being discernible; body tapers noticeably.

4. Point out that at 250 yards and 400 yards the foresight blade of the rifle approximately covers a man kneeling and standing respectively.

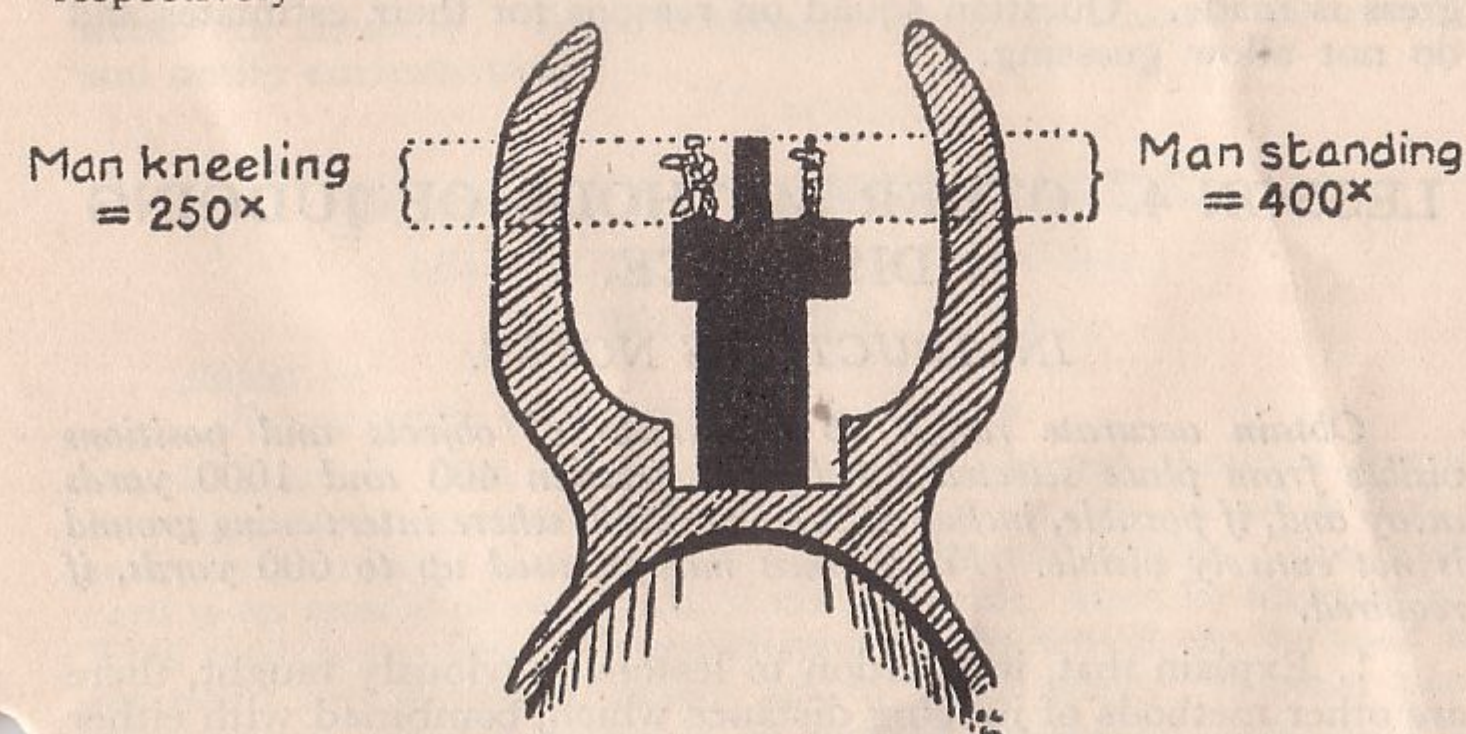


Fig. 1. Rifle Sight as an aid to Judging Distance.



5. Explain that varying conditions of light, background, size of object and surroundings have the effect of making an object look nearer or farther away. In the circumstances, there will be a tendency to under- or over-estimate; the judger must consider the conditions.

6. The object will look farther away :—

- (a) When the sun is shining behind it.
- (b) When judger is kneeling or lying.
- (c) When the background and object are similar in colour.
- (d) When looking across a valley, over undulating or broken ground and in dull or foggy weather.
- (e) When the object is small in comparison with other objects in its vicinity.
- (f) When the line of sight to an object is confined within narrow limits, such as an avenue of trees or a "ride" in a wood.

7. The object will look nearer :—

- (a) When the sun is shining behind the observer.
- (b) In bright light or clear atmosphere.
- (c) When the background and object are different in colour.
- (d) When intervening space is level (e.g., a plain or water) or when ground is covered with snow.
- (e) When looking upwards or downwards.
- (f) When the object is large in comparison with other objects in its vicinity.

8. Once elementary points have been brought out, continue lesson using enemy who are properly camouflaged and, when possible, objects such as trucks, motor cycles, light tanks and carriers.

9. Practise squad from all types of service positions on objects and men. Introduce a time limit for judging and shorten it as progress is made. Question squad on reasons for their estimates and do not allow guessing.

## LESSON 4. OTHER METHODS OF JUDGING DISTANCE.

### INSTRUCTOR'S NOTES.

*Obtain accurate ranges to a number of objects and positions visible from place selected for lesson, between 400 and 1000 yards away and, if possible, including some positions where intervening ground is not entirely visible. Fatiguemen may be used up to 600 yards, if required.*

1. Explain that, in addition to lessons previously taught, there are other methods of judging distance which, combined with either of the above, or on occasions used separately, will produce effective results.

### Halving.—

2. **Method.**—Estimation, either by the unit of measure or appearance method, to a point which is considered to be half-way. Double the estimate.

3. Practise squad on suitable points or fatiguemen; question on method used and indicate correct half-way point.

### Bracketing.—

4. **Method.**—Estimation of longest and shortest possible distances to the object and taking the mean, e.g., longest possible 1,000 yards: shortest possible 600 yards. Estimation, therefore, is 800 yards.

5. The greater the apparent range to the object, the wider should be the bracket.

6. This method will frequently be found useful when judging distance to objects where all intervening ground cannot be observed. This requires considerable practice or aptitude to obtain satisfactory results.

7. Practise squad on suitable points, question as to reason for brackets adopted and notify correct ranges.

### Key Ranges.—

8. Where an accurate range to a specific point is known, it should be possible, with a reasonable degree of accuracy, to determine the distances to other points or positions in its vicinity or direction.

9. Indicate a "key range point". Practise squad in estimating distances to suitable points in relation to it. Notify correct distances.

### Group Average.—

10. **Method.**—The leader calls for an estimate from each student and takes the mean. Wide estimates should be omitted.

11. Where personnel have developed a reasonable standard of judging distance, it will be found that this method will produce very satisfactory results.

12. Indicate point to which range is required and nominate leader (or leaders). When estimates are given discuss the results and notify correct range.

## LESSON 5. RANGE CARDS.

(For NCOs and selected men only.)

### INSTRUCTOR'S NOTES.

#### Stores.—

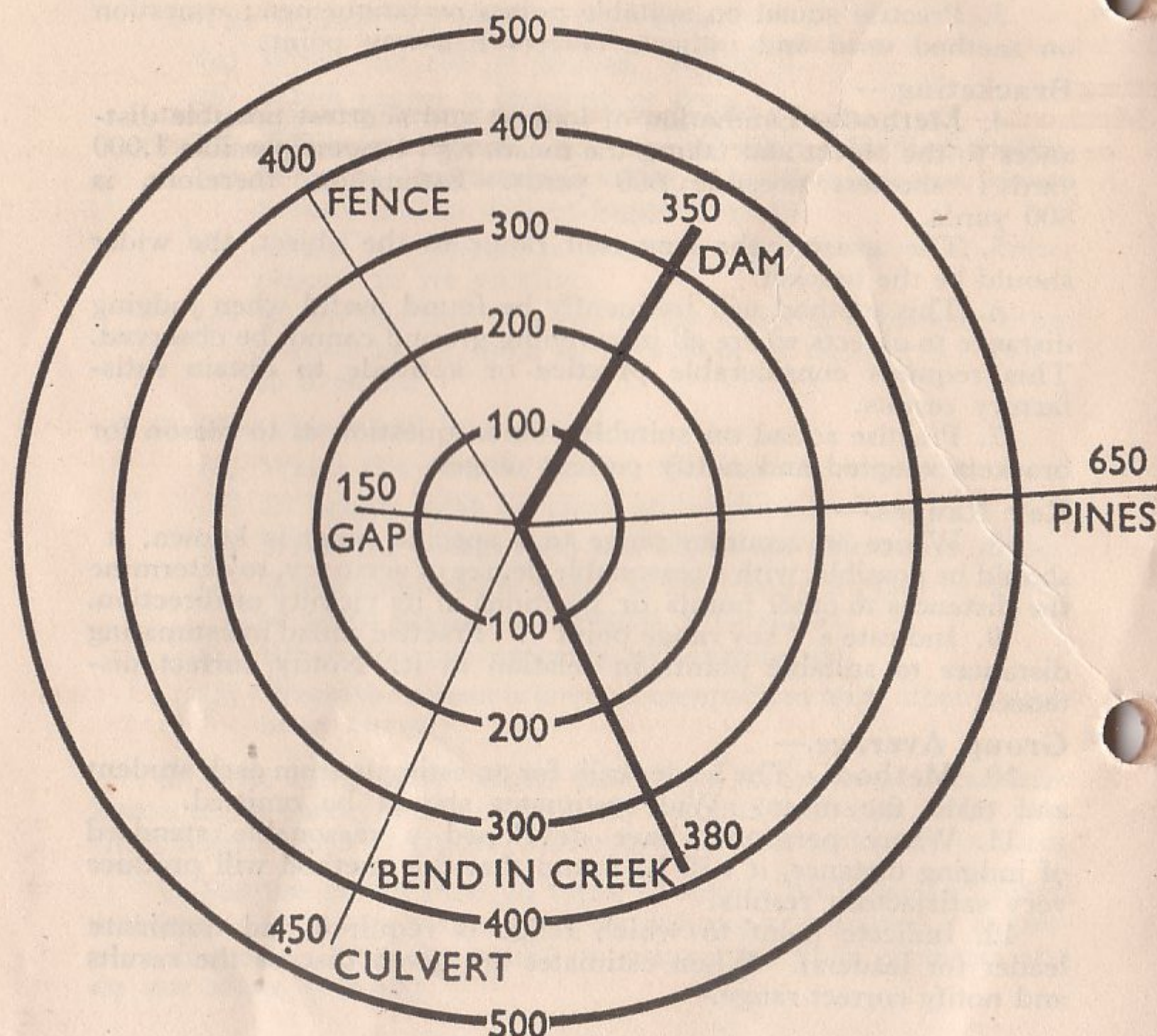
*Range cards and pencils for each man.*

1. Explain that, whenever possible all ranges obtained should be recorded on a range card. The reason for this record is that a ready reference is of great value in the heat of battle. The range card is an article of store and, if not available, must be improvised. This card is marked with equidistant circles which can be used to represent any series of ranges up to 2,000 yards. Explain that, although an arc will probably be allotted for special responsibility, ranges must be recorded in every direction and that the circular card is designed to emphasize the principle of all-round defence.



2. Explain and demonstrate the following successive steps in filling in a range card.—

- (a) Mark off on the card the position from which the ranges are taken. Describe this position accurately.



Point from which made out:—Left end of Bren position.

Method of obtaining ranges:—J D and Section Average.

Made out by:—A. Digger Cpl. Date:—25 Apr 44.

Fig. 2 Range Card (ranges suitable for a section).

- (b) Select two unmistakable objects in the area, one of which will be to the front and the other, if possible, to the rear of the position, and draw a thick setting ray to each.
- (c) Select objects to which ranges are to be recorded. These should include positions which the enemy may have to occupy or near which he is likely to pass—e.g., obstacles, a gap, etc. Put in range to be represented by each circle on the card.

- (d) Keeping the card on each setting ray in turn, draw rays to show direction of objects selected, the rays to be in lengths corresponding to distances.
- (e) Write a short description of each object as it appears to the naked eye; these should be written in block letters.
- (f) Write the range to each object against the description.
- (g) Sign and date card and state how ranges were obtained.

3. In use, the range card is set by raising the card level with and close to the eye, and directing the setting ray on the object named. Once the card is set, objects ranged on can be identified immediately by any observer.

4. Practise squad in making out range cards.

## JUDGING DISTANCE TEST.

1. All personnel of field units of the AMF (including officers below field rank) will undergo a yearly test in judging distance, as set out below.

### Method of Conducting Test.—

#### 2. Personnel other than MMG.

- (a) Recruits will judge up to 800 yards, other personnel up to 1,000 yards.
- (b) No assistance from maps, key ranges or other means will be allowed, but men armed with a rifle may use it as an aid.
- (c) Four objects, comprising a reasonable variety of distances within the limits given, will be selected. Two will be natural objects, such as likely hostile fire positions and two will be men or vehicles which, on a given signal from the judging position, will be exposed.
- (d) To ensure that the men are observed, two will be employed. One will fire three rounds of blank at a slow rate of fire. The other will wave a flag until the third round of blank has been fired. Both will then stand "at ease" while the distance is being judged. Vehicles will remain exposed for one minute.
- (e) Estimates will be given in 50 yards. Personnel not armed with rifles will write down their estimates and those with rifles will adjust their sights to the estimated distance, either method to be completed within the specified time limit.
- (f) The positions for those undergoing the test will be lying, kneeling or sitting, as ordered by the officer conducting the test.
- (g) The time limit will be half a minute for each estimate and will be imposed as under:—
- (i) **Natural objects.**—From the moment the officer conducting the test is satisfied that his indication of the object has been sufficiently clear to ensure recognition.



- (ii) **Fatiguemen.**—From the sound of the third shot or, if that is inaudible, from the moment the flag is lowered.
- (iii) **Vehicle.**—From the moment it moves to return to cover.
- (h) The procedure for conducting the test will be:—
  - (i) At the conclusion of the time limits a whistle will be blown, whereupon those judging distance will stand "at ease", each individual remaining in this position until the register keeper is ready to record his estimate. After the whistle sounds, no adjustment of sights or writing will be permitted. If any of those under test have failed to recognize any object, they will be recorded as having "Failed" for that object.
  - (ii) Register keepers will go to each individual in turn, examine the sights of the rifle (or the written estimates) and record the estimates shown on the sights (or written down) in the register (AAF C 5). On completion, the officer conducting the test will order "Check" and register keepers will call over the names and the distances recorded. This procedure will be repeated for each object.
  - (iii) No other entry will be recorded on the AAF C 5 until after the test when AAF C 5's will be handed to the officer conducting the test. He will fill in (in ink) the correct distance and permissible error, the error, if any, made by the individual and his qualification. The register will then be signed by the officer conducting the test. Registers will be preserved for record.
  - (iv) On completion of the test, the officer conducting it will announce the correct distances and comment on conditions of light, shade, background, etc. The object of this is to enable individuals to make notes to assist in ascertaining why certain distances have been over- or under-estimated.
- (i) Permissible errors and standards of efficiency are:—
 

For distances from 200 yards to 300 yards ...	50 yards
" " " 350 " " 700 " ...	100 yards
" " " 750 " " 1000 " ...	150 yards

 In order to pass, three distances must be judged within the permissible error.
- (j) Personnel who are tested will either "**Qualify**" or "**Fail**". An individual who does not attend any test will be graded as "**Not exercised**".

### 3. MMG Personnel.

**NOTE:**—In the test, "estimating" implies determining the distance by key ranging, whilst "judging" is without such assistance.

- (a) Gun numbers will judge on two objects, both under 1,000 yards and not nearer than 600 yards. They will estimate another distance to an object not more than 1,000 yards away and which is a reasonable distance from a key range.
- (b) Officers, WOs and NCOs and selected privates will undergo the test for gun numbers and, in addition, will estimate the distance to two objects not farther than 2,000 yards away, each within a reasonable distance of a key range.
- (c) If possible, all objects will be natural. Otherwise, artificial objects such as camouflage screens etc., may be substituted.
- (d) Distances will be declared in 50 yards. They will be written down within the specified time limit.
- (e) Positions for those undergoing the test will be lying, kneeling or sitting, as ordered by the officer conducting the test.
- (f) Time limit will be half a minute for each distance and will be imposed from the moment the officer is satisfied that his indication of the object has been sufficiently clear to ensure recognition.
- (g) The procedure of conducting the test will be as follows:—
  - (i) At the conclusion of the time limit a whistle will be blown. Personnel thereupon will stand "at ease". No writing will be permitted after the whistle sounds. If any of those under test fail to recognize an object they will be recorded as having "Failed" for that object.
  - (ii) The register keepers will go to each individual in turn and will record on the register (AAF C 5) the distance written down. On completion, the officer conducting the test will order "Check", and register keepers will call over the names and distances recorded. This procedure will be repeated for each object.
  - (iii) No other entry will be recorded on the AAF C 5 until after the test when AAF C 5's will be handed to the officer conducting the test. He will fill in (in ink) the correct distance and permissible error, the error, if any, made by the individual and his qualification. The register will then be signed by the officer conducting the test. Registers will be preserved for record.
  - (iv) On completion of test, the officer conducting it will announce the correct distances and comment on the conditions of light, shade, background, etc. The object of this is to enable each individual to make notes to assist in ascertaining why certain distances have been over- or under-estimated.



(h) Permissible errors and standards of efficiency are :—

(i) Judging.—

For distances from 600 to 700 yards	...	100 yards
" " " 750 " 1000 "	...	150 "

(ii) Estimating.—

Up to 1500 yards	...	50 "
From 1500 to 2000 yards	...	100 "

(iii) In order to "Pass", gun numbers must be correct with permissible error in two out of the three distances : officers, WOs and NCOs and selected privates—in four out of five distances.

(iv) Personnel who are tested will either "Qualify" or "Fail". An individual who does not attend the test will be graded as "Not exercised".

- NOTES :—
1. Key ranges from which estimations are required will be given out to those under test to the nearest yard.
  2. The ranges to objects which are to be estimated will be considered as being to the nearest 50 yards below or above. Those being tested will be given the benefit of the doubt in assessing their standard of efficiency, e.g., a distance of 1387 will be considered as 1350 or 1400 and distances given as 1300 and 1450 accepted as passing.
  3. Objects to be "judged" on will be selected wherever practicable, so that the distance to them is as near as possible a multiple of 50 yards. Where this is not possible, the principle laid down in note 2 will apply.

## Chapter III.

# FIRE CONTROL

### Precis of Lecture to Fire Unit Commanders and Selected Privates.

#### 1. Meaning of Terms.

- (a) **Fire direction.**—The platoon commander's order to fire unit commanders, dealing with application of fire according to the fire plan made by battalion and company commanders.
- (b) **Fire control orders.**—Orders given by a fire unit commander.

2. **Fire Control.**—However skilful the man may have become, fire effect will not be obtained unless the fire unit commander can give a correct fire order. The fire unit commander must, therefore, be trained to frame fire orders and indicate targets.

3. **Considerations in Opening Fire.**—Fire unit commanders must seize every chance to kill the enemy. To achieve this object they must decide :—

- (a) Is the opening of fire justified by the range, visibility, and vulnerability of the target? Surprise must be sought and is often obtained by "holding fire" until the enemy is on the particular area of ground (previously selected by the fire unit commander) which will give the best chance of annihilating the enemy.
- (b) What is the best weapon or combination of weapons to use?
- (c) Are single rounds or bursts required? If bursts, should slow or rapid be employed? Rapid fire will be used only when maximum volume or surprise effect is essential. The reason for an LMG firing single rounds must never be forgotten.

#### Fire Control Orders.—

4. Good indication of targets is essential and constant practice necessary under realistic conditions. Orders must be brief and clear; **aids being used only when unavoidable.** Orders must be given calmly, loudly, concisely and with pauses between parts to allow them to be understood and acted upon.



### Examples:—

After ordering the range—allow time for sight setting. After “Rapid”—pause for aim to be taken. Give correction for range by “Stop. Up ... hundred—Go on”; “Stop. Down ... hundred—Go on”.

5. A whistle blast may be necessary in action, to attract the attention of members of the section or sub-unit, before ordering “Stop”.

6. The designation of the unit, e.g. “No ... section”, will be referred to and will imply the employment of the whole fire of the section. The terms “Riflemen” and “Bren” will be included after such designation when either the rifle group or Bren group only are required to fire, e.g., “No ... section—riflemen” or “No ... section—Bren.”

**NOTE:—** The Bren group may frequently have to act independently. They must, therefore, thoroughly understand the principles of application of fire. Training must NOT be confined merely to carrying out fire orders—they must be trained to engage targets correctly in accordance with general orders. In fact, their only guidance at times may be a brief directive, e.g., “Go to the other end of that ridge and engage any enemy appearing on the right flank”. Therefore, on no account should men be led to assume that they will always act under the direct fire orders of the section commander.

7. It must be realised that the indication of targets in the attack is normally a far more difficult problem than in defence.

8. Fire orders are not an end in themselves; they are designed for one purpose only—to bring fire down on the enemy as quickly and as effectively as possible. It is always the indication of the target which presents the real problem. Therefore, any method of indication which brings fire down on the right place, in the right volume and at the right time, must be considered sound.

9. The following points should be noted:—

(a) **Use of tracer ammunition for indication of targets in the attack.** (Will destroy concealment if used in defence). A round of tracer fire by a person who has located the target will assist the remainder (who have been ordered to watch its flight) to recognise the enemy's position.

(b) **Location of target by member of section.**

(i) In such case he should immediately warn the section commander, who in the case of a target difficult to indicate may order him to fire a round (or a round of tracer) whilst the remainder observe and locate the target.

(ii) A target which is difficult to indicate may be catered for by the section commander himself taking over the Bren (in the case of a Bren target), ordering the remainder to watch in a specified direction, and firing a burst either at the target or on to a suitable area for observation in its vicinity. In the latter case he will use the strike as a reference point to assist further indication.

### 10. Concentrated and Distributed Fire.—

The best method of engaging targets is with enfilade fire. If this is not possible, targets with little width should be engaged by concentrated fire; wide targets by distributed fire. Explain the method of distributed fire. As a guide—if the width of a target is more than half a degree, fire should be distributed.

### 11. Sequence of Fire Control Orders.—

Sequence.	Reasons.	Order.
(a) Designation of unit.	To make it clear to whom the order is addressed.	“No ... section”. “No ... section—Bren”. “No ... section—riflemen”.
(b) Range.	To allow concentration on recognizing the target once the sights are set, and to limit the area in which to search for target.	“Five-hundred”.
(c) Indication.	Direction and description of point of aim.	“Quarter left—gate—slightly right—small bush”.
(d) Kind and type of fire.	Dependent on the target and situation at the time.	“Fire”. “Bursts-Fire”, or “Rapid-Fire”.

### 12. Fire Control at Night, in Fog or Mist.—

At night, fire control will be limited to brief commands, e.g., “Fire,” “Rapid Fire,” “Stop.” The material effect may not be considerable, except against an enemy in movement, but the moral effect will be great. Greatest effect will be produced by foreseeing likely enemy lines of approach and by arranging to sweep these with fire. The light machine gun can be mounted on its tripod and fired on “fixed lines” or within fixed limits to cover such approaches (see Pamphlet No. 4).

### SYSTEM OF TRAINING.

13. Training starts with simple fire control orders, progressing to problems including realistic battle situations. Lessons, whenever possible, will be carried out on suitable ground. When this is not



available, use must be made of landscape targets. NCOs and men must have constant practice throughout their service in giving, and acting upon, fire control orders.

14. A valuable means of testing NCOs in indication and soldiers in recognition is afforded by the use of harmonized sights with landscape targets on the miniature or 30 yards range (see Pamphlet No. 1), but the greatest value will be obtained by practice in indication and recognition on the field-firing range. The latter will also afford opportunities for practice in observation and control of fire, including switching to fresh targets and sub-division of fire within the unit.

#### Method of Teaching Leaders Fire Control.—

15. This training should be carried out in the open. An arc, or a general direction (depending on whether **defence** or **attack** situations are being dealt with), should be pointed out and a simple tactical situation explained. Reference points and their ranges should be settled.

16. Three methods of setting problems are:—

- (a) The instructor has two rifles placed in aiming rests and uses either one or both as required, e.g., one when it is intended to indicate a target for a concentrated order and both for a distributed fire order, one rifle being aimed at each end of the target. Having thus indicated the target, he orders one of the leaders under instruction to look along the sights and give a fire order on to the target thus indicated. The remainder of those under instruction will lay aims, using aiming rests, on what they consider to be the target. The instructor looks along each rifle, insisting on accuracy of aim.
- (b) Concealed enemy are called up individually and fire blank while the squad, except the commander, is turned about. The enemy again conceal themselves and the squad is again turned about. The commander gives his fire control order, the squad adjust their sights and each man lays his rifle from his rest on to the point at which he would have fired. Finally, the enemy is again called up and aims and sights are checked.
- (c) By using men to represent enemy, problems in fire control requiring all types of fire orders can be staged. The enemy will represent various situations calling for concentrated and distributed fire. Additional situations requiring anticipatory and individual fire orders will also be arranged. The different situations will be controlled by prearranged signal, on which those under instruction will give their fire orders. Live ammunition will be used where possible by the enemy in these situations (see General, paragraph 9 (b)).

17. Careful rehearsal of the enemy is necessary and after each problem fire control orders will be discussed (see paragraph 18). The effect of wind must not be forgotten. If practice takes place on a calm day, some problems should include imaginary left or right winds.

#### 18. Method of discussing Fire Control Orders.—

Full value of problems is obtained only by checking aims and discussing probable fire effect. When little or no fire effect is obtained, the fire control order must be analysed as follows:—

- (a) Was it given as an order in the correct sequence?
- (b) Was it suitable to the nature of the target?
- (c) Was the range approximately correct?
- (d) Was the indication clear and concise?
- (e) Was it necessary to use "aids"?
- (f) Was the rate of fire suitable?
- (g) Was the effect of wind considered by the firer?
- (h) Should single rounds or bursts have been used?

## LESSON 6. FIRE CONTROL ORDERS EASY TARGETS.

### INSTRUCTOR'S NOTES.

*Stores.—*

*Aiming rests; landscape target (if necessary).*

*Accuracy of aim must be insisted upon at all times. Indicate the general line of direction (ATTACK) or arc (DEFENCE).*

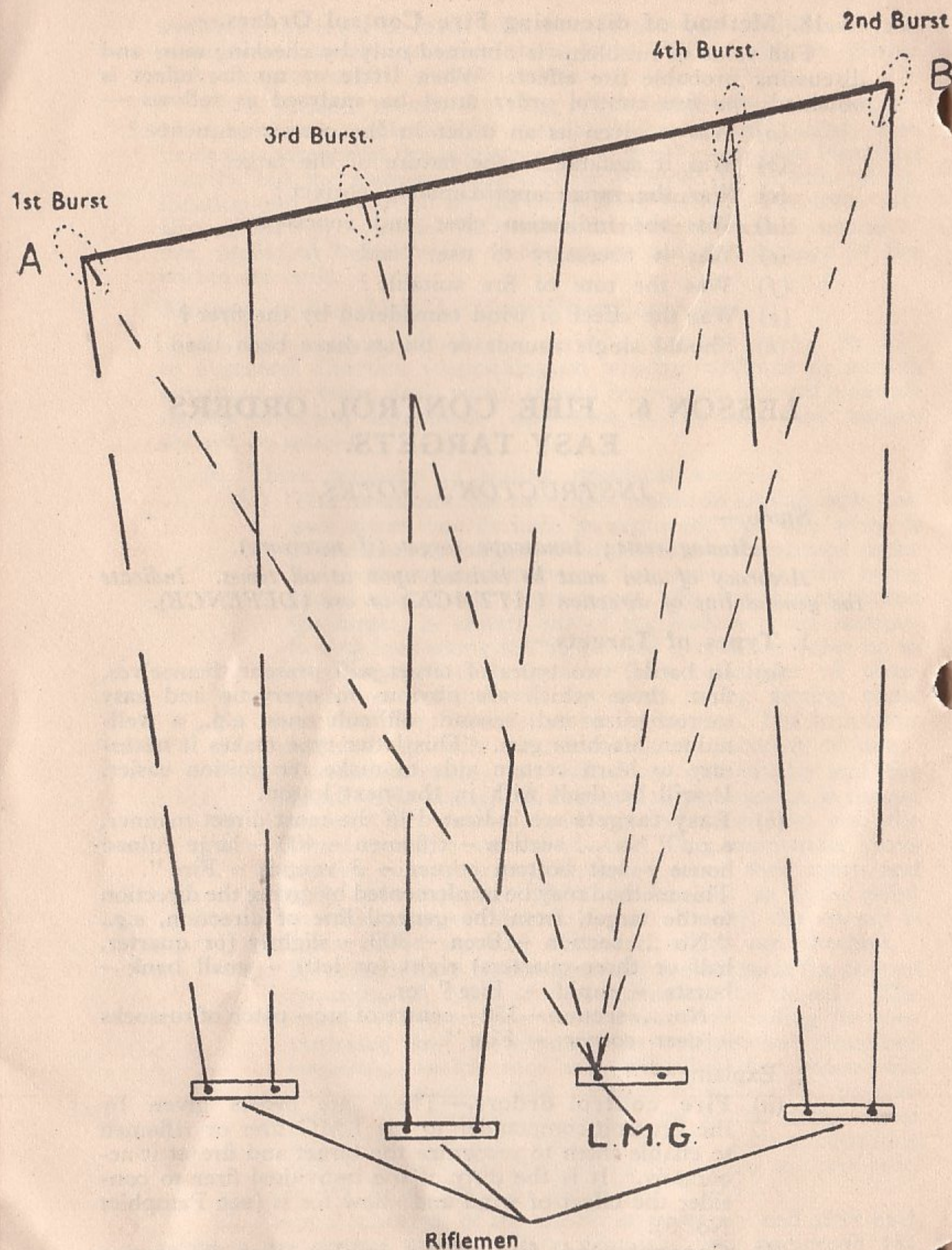
#### 1. Types of Targets.—

- (a) In battle, two types of target will present themselves, first, those which are obvious to everyone and easy to recognize and, second, difficult ones, e.g., a well-hidden machine gun. This latter type makes it necessary to learn certain aids to make recognition easier. It will be dealt with in the next lesson.
- (b) **Easy targets** are indicated in the most direct manner, e.g., "No ... section - riflemen - 400 - large ruined house - left bottom corner - 3 rounds - Fire". This method may be implemented by giving the direction to the target, from the general line of direction, e.g., "No ... section - Bren - 300 - slightly (or quarter, half or three-quarters) right (or left) - small bank - bursts - rapid - Fire" or, "No ... section - 350 - centre of arc - patch of tussocks - near corner - Fire".

#### 2. Explain:—

- (a) **Fire control orders.**—These are orders given by the fire unit commander to his LMG firer or riflemen to enable them to recognize the target and fire at it accurately. It is the duty of the individual firer to consider the effect of wind and allow for it (see Pamphlet No. 3).
- (b) **Concentrated fire.**—This implies that the section directs all its fire to the same point. When a large target is engaged, a definite point of aim will be given,





A—B = Limits indicated by fire unit commander.

Fig. 3. A section engaging a wide target.

e.g., "Right (or left) end", "Top corner". With small targets where no point of aim is given, aim will be directed at the centre.

(c) **Distributed fire.**—It may be necessary to engage a wide target such as enemy lining a hedge, from one end to the other. Such a target requires the fire to be distributed. The extent of the target will be indicated immediately after one end of it has been named. The fire order is obeyed—

(i) **By the light machine gunner** distributing his fire by single rounds or in bursts at irregular intervals, between the limits of the target and by avoiding systematic traversing.

(ii) **By the riflemen** firing at approximate points between these limits, corresponding with their places in the section.

(When more than one section is engaging the same distributed fire target, each will conform to the foregoing method. This will ensure that the fire of each section is distributed over the whole of the target.)

(iii) "No. ... section" implies that the whole section will fire. When the Bren only is required, the order "No. ... section - Bren" will be given. Should the riflemen only be required to fire, the order will be "No. ... section - riflemen".

**Examples.—**

1. **Concentrated Fire.**—

**Whole section.**—"No. ... section - 250 - windmill - directly below, isolated clump of bushes - right edge - Fire (or - bursts - Fire, or - rapid - Fire) - Stop".

**Bren group.**—"No. ... section - Bren - 250 - windmill, etc."

**Rifle group.**—"No. ... section - riflemen - 250 - windmill - etc. - Fire (or - rapid - Fire) - Stop".

2. **Distributed Fire.**—

"No. ... section - 400 - windmill - right - a line of dark bushes - from left edge - right - to gap - Fire (or - bursts - Fire, or - rapid - Fire) - Stop".

**NOTE :—** Example 2 illustrates the employment of the whole section, the order being amplified to cater for the use of the Bren group or rifle group only, as shown in Example 1.

(iv) Where the whole section is being employed and "bursts" or "Fire" are ordered, riflemen will produce fire at their normal rate, i.e., 5 rounds per minute. Should "rapid" be included in the order, they will produce their best rate of fire, consistent with accuracy.



- (v) Production of fire will normally be controlled by "Fire" and "Stop". The section commander may, however, specify the number of bursts or rounds, should he consider it desirable, in special circumstances.

3. Practise squad on easy targets (concentrated and distributed fire). Check aims and discuss probable fire effects.

## LESSON 7. FIRE CONTROL ORDERS DIFFICULT TARGETS.

### INSTRUCTOR'S NOTES.

#### Stores.—

*Aiming rest; landscape target (if necessary); degree scale.*

*A portable degree scale may be made out of a strong wooden board marked into divisions representing degrees at a distance of 10 yards. The board should be 10 feet in length (thus allowing the distance of 10 yards to be measured accurately) marked, "O" at its centre point and with nine divisions of 6.3 inches, numbered 1-9 consecutively, marked off on either side of this central point. This is sufficiently accurate for practical purposes.*

*For practice, a degree scale calculated for a given distance (say 20 yards) can be painted on a wall in barracks.*

*The distance, in each case, will be measured from the position of the eye when in normal firing position.*

*Accuracy of aim must be insisted upon at all times. Indicate general line of direction (ATTACK) or arc (DEFENCE).*

#### Aids.—

1. The following aids are available for use in indicating difficult targets.

- Reference points.
- Last target.
- Vertical clock (in conjunction with the above)
- Degree measurements.
- Finger measurement.

2. Explain, giving illustrations where necessary :—

#### (a) Reference points.—

- A reference point is selected by the section commander. It should be a prominent object and the range to it should be given. If more than one is used, the objects must be well apart and of different kinds.
- The reference point chosen will be given a short, definite name, which must be known by all members of the section.

- Points originally used for indicating the lines of the right and left of arc should not be regarded as reference points but may be so used, provided that they are specifically designated.

- Example** of the application of a reference point (Rocks) as an aid :—

"Rocks - slightly left - cart track - far end".

- Last target.**—The last target engaged may be used as an aid if it is near the target to be indicated.

#### Example :—

"Last target - near end - slightly left and this way - green patch - top corner".

- Vertical clock.**—The vertical clock ray may be used in conjunction with above methods, which form the centre of the clock face and are named first, followed by the clock ray. The word "right" (or "left") precedes the clock ray, e.g., "right - 4 o'clock" or "left - 10 o'clock". The rays 12 and 6 o'clock are not preceded by any direction.

#### Example :—

"Windmill - right - 4 o'clock - small bush". (See Fig. 4.)

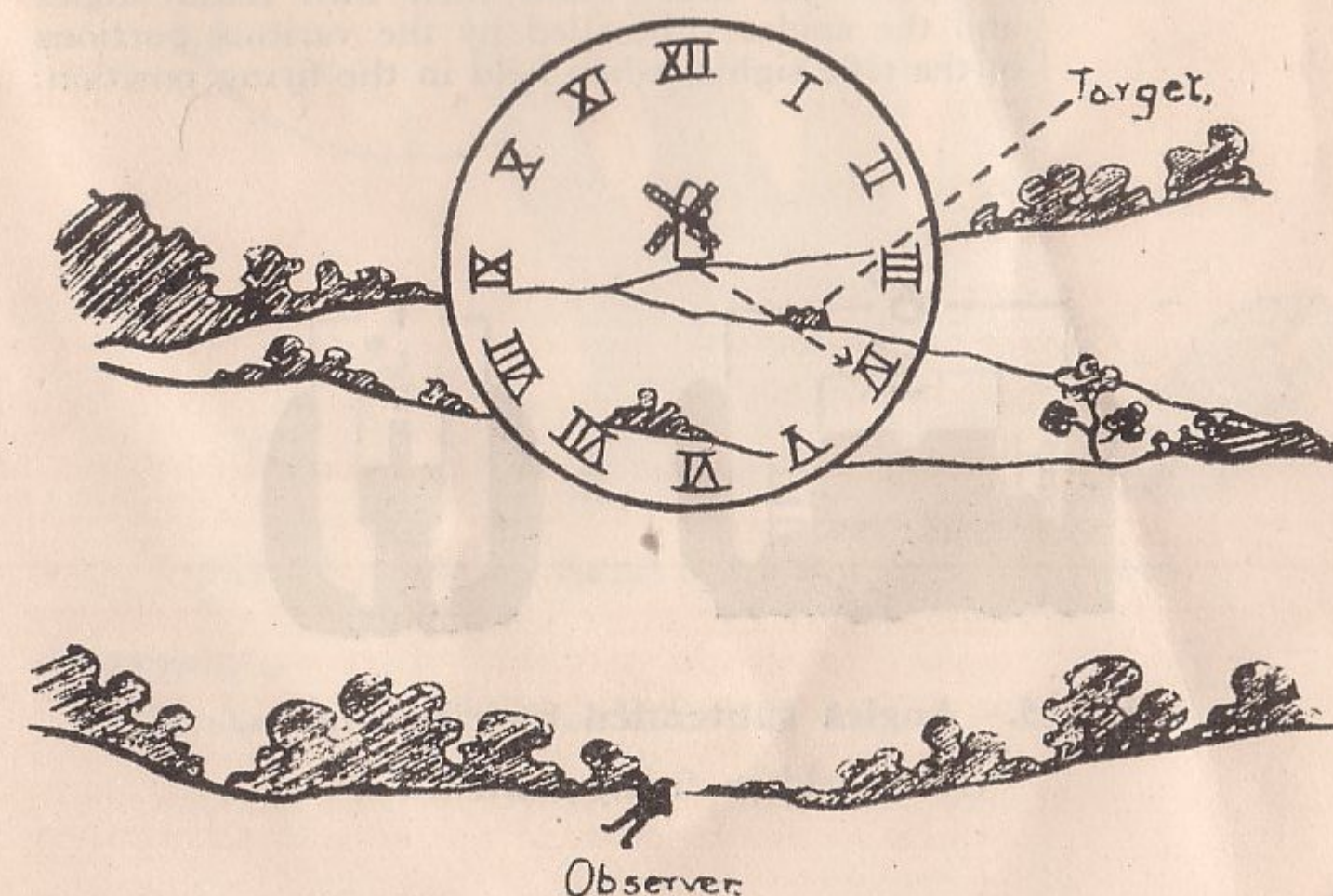


Fig. 4. Use of vertical clock ray in indication



(d) Degree measurement.—

- (i) The degree method is useful for indicating distance from a reference point, etc., in such a manner as to differentiate between two close and similar objects. The degrees can be measured by grati-culed glasses, the traversing arc of the Bren tripod, MG tripod dial, slide rule, portions of the rifle sights or by portions of the hand when held fully extended. The degrees obtained may be used in conjunction with the vertical clock, or separately, to indicate targets.

Examples :—

Used in conjunction with vertical clock ; refer-  
ence point "twin trees"

"Twin trees - right - 3 o'clock - 3 degrees  
- small grey stump".

Used separately—

"Twin trees - left - 2 degrees - pointed  
bush".

NOTE :— In an indication, degrees above nine will be  
given out as under :—

10 degrees as "one owe" degrees.

19 degrees as "one nine" degrees.

- (ii) All personnel must know their own hand angles  
and the angles subtended by the various portions  
of the rifle sights, when held in the firing position.

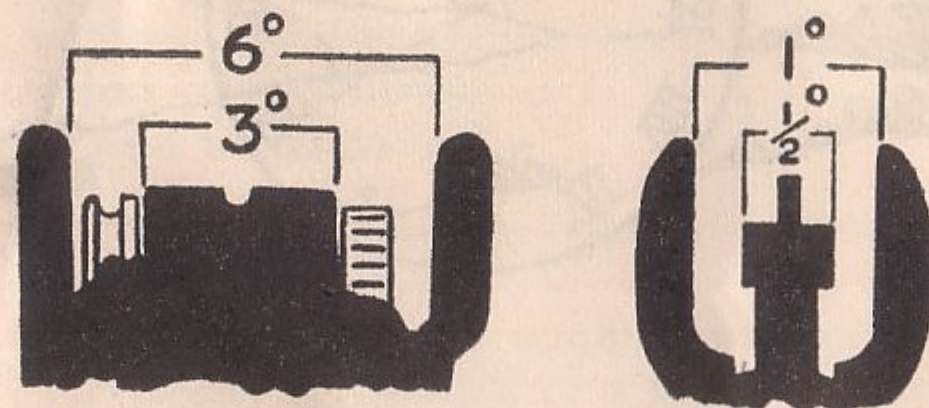


Fig. 5. Angles subtended by rifle sights.  
(Rifle held in firing position.)

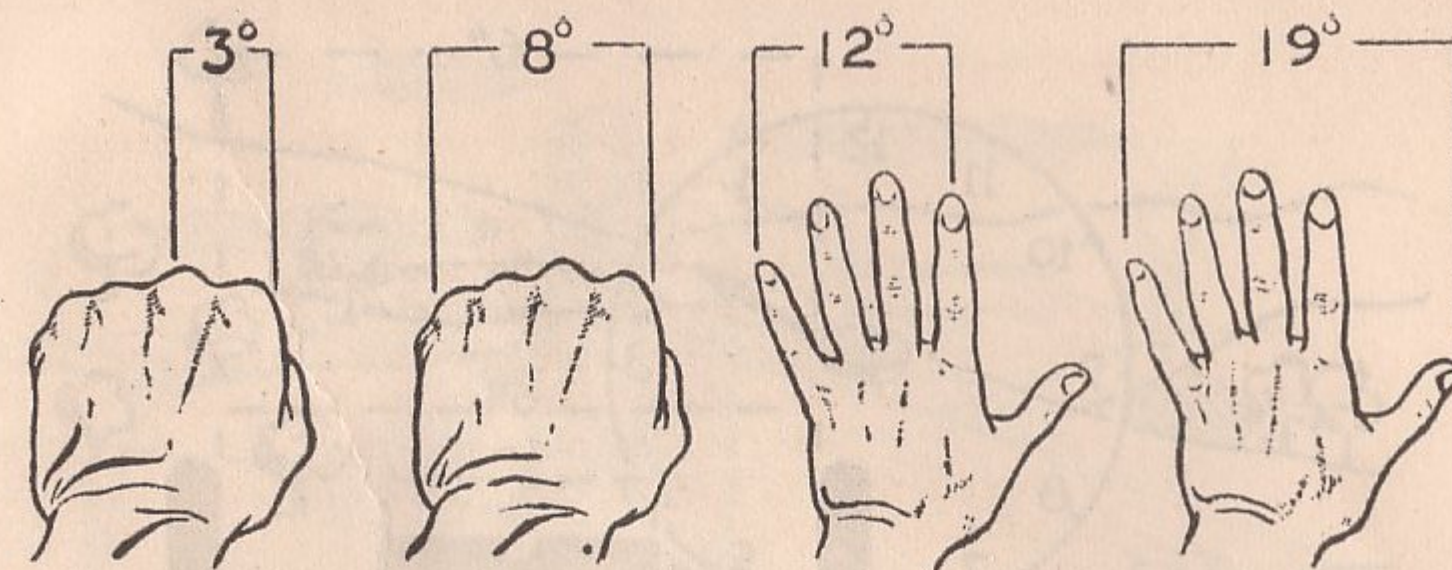


Fig. 6. Angles subtended by portions of the hand.

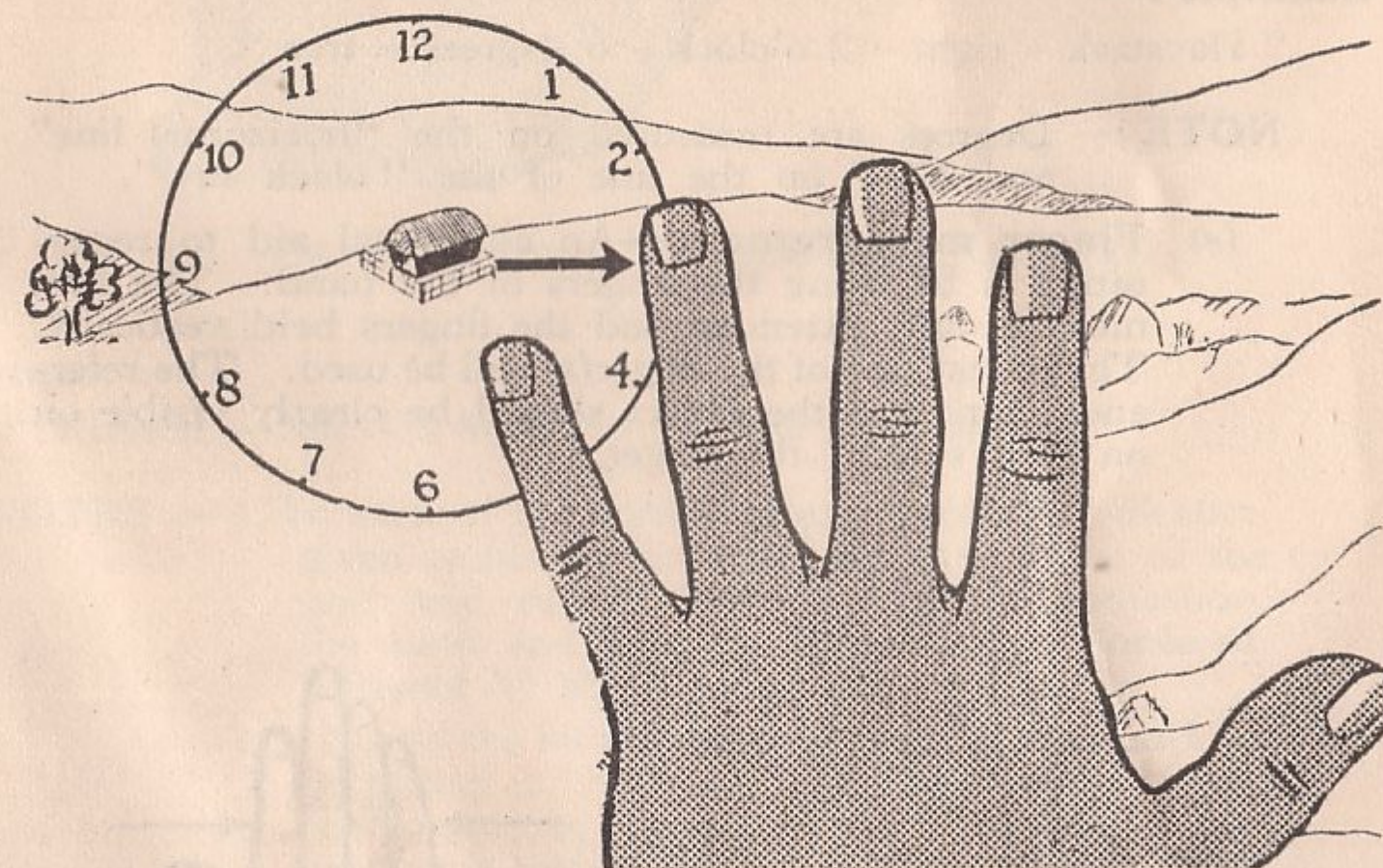


Fig. 7. Use of hand for measuring degrees.

Example :—

"Haystack - right - 3 o'clock - 12 degrees - gap in rocks"



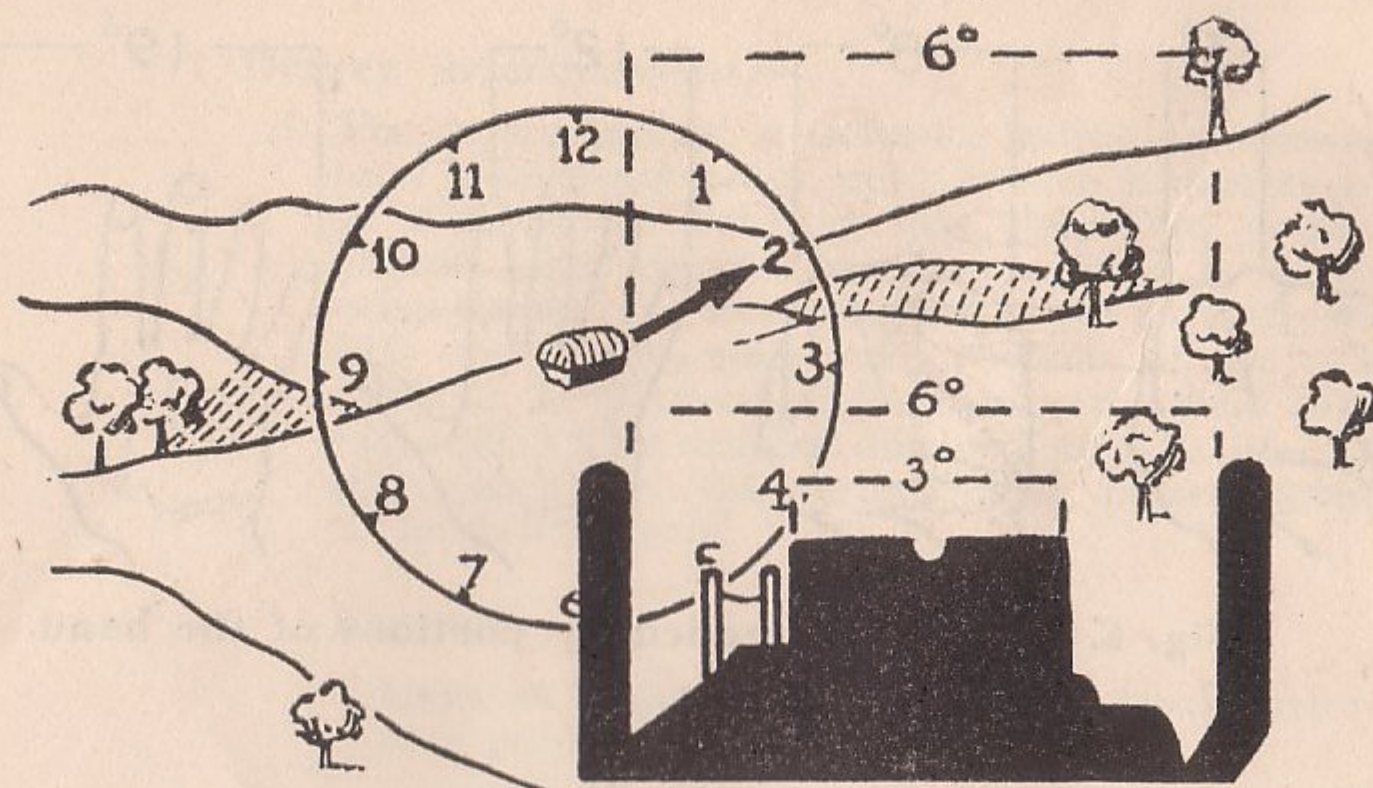


Fig. 8. Use of rifle for measuring degrees.

**Example :—**

“ Haystack - right - 2 o'clock - 6 degrees - tree ”.

**NOTE :—** Degrees are measured on the “horizontal line” and NOT on the line of the “clock ray”.

(e) **Finger measurement.**—An additional aid to recognition is by using the fingers of the hand. The arm must be fully extended and the fingers held vertically. The widest part of the finger(s) will be used. The reference point and the object should be clearly visible on each side of the finger.

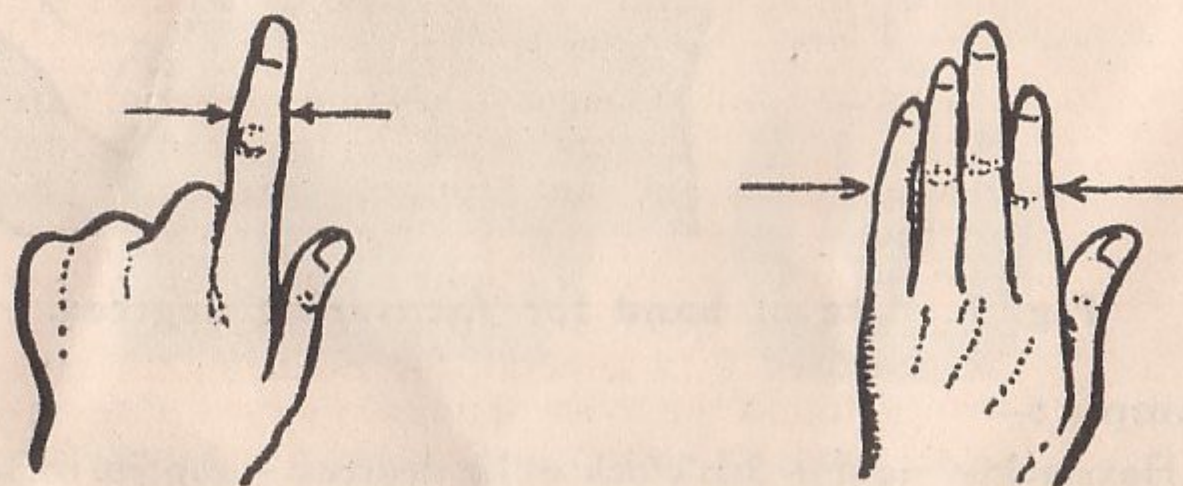


Fig. 9. Method of using finger measurements.

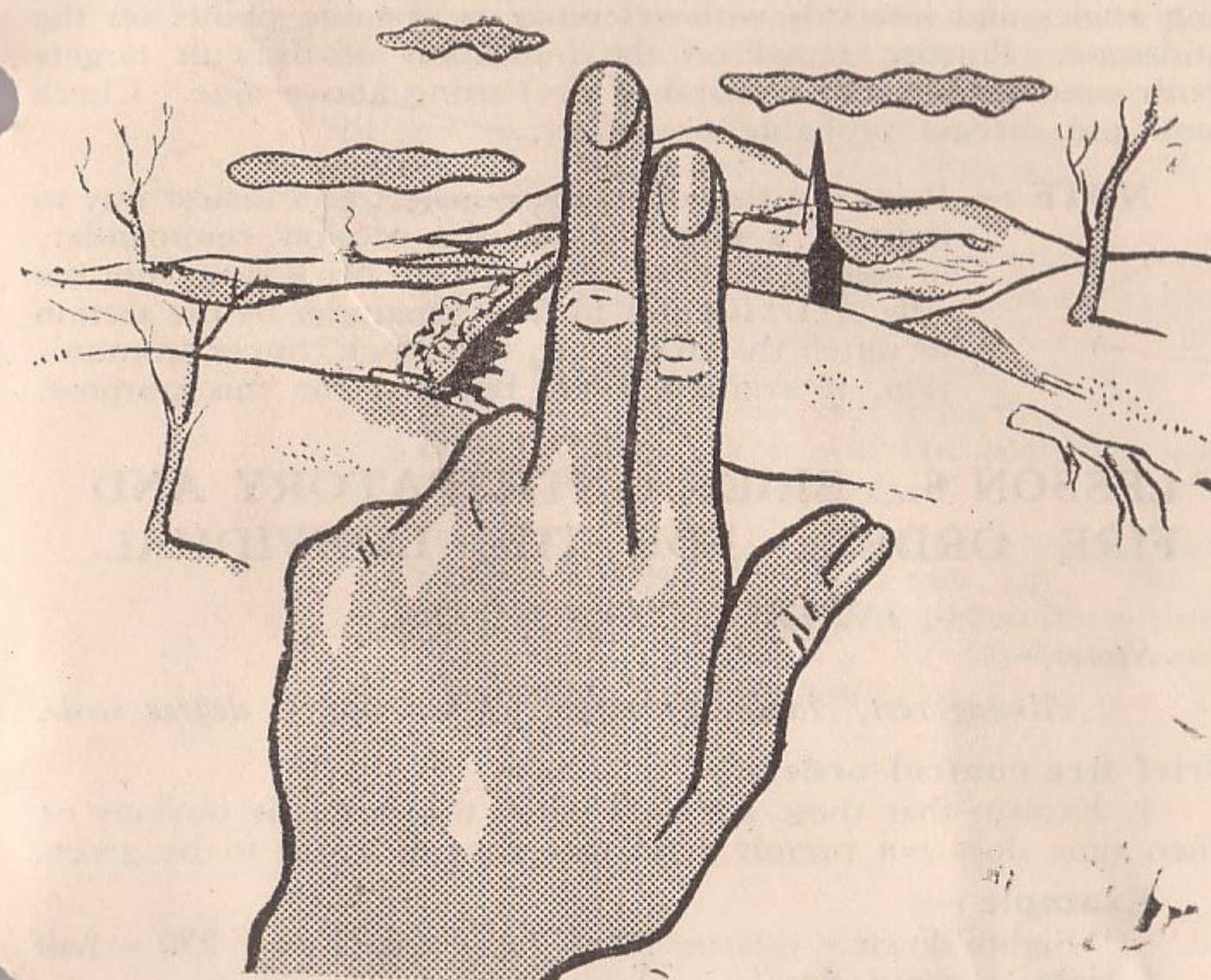


Fig. 10. Use of fingers for measuring interval.

**Example :—**

“ Church - left - 2 fingers - far end of hedge ”.

**NOTES :—**1. In each of the foregoing examples, the indication given would be preceded by designation of the unit and range. After giving the indication, the kind and type of fire would be ordered, followed by the order to fire.

2. During the initial stages of training personnel are permitted to measure both degrees and finger measurements in an upright position. The instructor must, however, make it clear that they will normally be applied whilst the soldier is in a firing position. In later stages this will be practised. In general, for riflemen, the rifle will be found the most practical method of measuring, and less likely to lead to disclosure of a position.

3. Practise squad in measurement of angles, by means of aids explained under paragraph 2, (a) to (d), using a prepared scale on a wall or a portable degree scale. Tests may be given in similar manner.



4. Demonstrate application of the various methods of measuring angles and intervals with reference to specific points on the landscape. Practise squad on the indication of difficult targets (both concentrated and distributed fire) using above aids. Check aims and discuss probable fire effect.

**NOTE :—** Point out that often the quickest and easiest way to indicate a target is for the section commander, or soldier who has spotted it, to fire a shot from the rifle or LMG and for the remainder of the section to watch the strike. In the attack, tracer ammunition, if available, may be used for this purpose.

## LESSON 8. BRIEF, ANTICIPATORY AND FIRE ORDERS FOR THE INDIVIDUAL.

### INSTRUCTOR'S NOTES.

#### *Stores.—*

*Aiming rest, landscape target (if necessary); degree scale.*

#### **Brief fire control orders.—**

1. Explain that these are used when the target is obvious or when time does not permit a full fire control order to be given.

#### **Example :—**

"Sights down - quarter left - rapid fire" or "250 - half right - rapid fire".

#### **Anticipatory fire control.—**

2. Explain that these orders are used when anticipating either the movements of our own troops or those of the enemy.

#### **Example :—**

"No. ... section - 400 - farm house - immediately below - hedge - open rapid - await my order".

**NOTE :—** From the above it will be seen that all preparations for opening fire have been made, but the actual opening of the fire is withheld until it is required.

3. Practise squad.

#### **Fire orders for the individual.—**

4. Explain that this type of order is designed to ensure that the gunner or any individual rifleman can apply fire quickly as opportunity offers. It will normally be used at fairly close ranges. The whole area will be watched and enemy will be engaged immediately they appear.

#### **Example :—**

"No. .... section - 300 - slightly left - low scrub - enemy in that area - fire when you see a target".

**NOTE :—** The gunner will fire either bursts or single rounds according to the target.

5. Practise squad.

**NOTE :—** In the defence there is one over-riding consideration in fire control—that the premature opening of fire may in a few seconds give away positions to the enemy and destroy the effects of hours of hard work in concealment. The following points should be remembered :—

- (a) After allotment of arcs, reference points, range cards, etc., lay down definite aiming points at which fire may be opened, e.g., "No. ... section - riflemen. You will not open fire until the enemy cross that fence" or "No. ... section - Bren. You will not open fire until the enemy pass that hedge."
- (b) It may be possible (and desirable) on occasions to have a silent or hidden gun, e.g., "No. ... section - Bren. You will not open fire without a direct order from me". ("M" represents the platoon commander).



# APPENDIX

## OBSERVATION OF FIRE AND RANGING.

*This subject is best taught as a demonstration on a field-firing range or area of ground.*

*As many as possible of the following lessons should be given, each in the form of a demonstration accompanied by a brief explanation. Spectators should be questioned frequently.*

*Spectators should be positioned behind the weapon firing, except in paragraph 7, when they should be to a flank of the danger zone. Tracer ammunition should be used for this phase.*

*Before this demonstration is carried out it is essential that NCOs at least should have received a lecture and demonstration in elementary theory*

### Observation of fire.

1. **Explain :—**Observation of fire is vital since it is the quickest and best method of ensuring that fire is applied to the target. It automatically counteracts errors made, not only in range estimation but also in the sighting of the weapons themselves.

**Demonstration :—** This may be carried out by an LMG known to shoot low, firing at a ground target with the true range to the target on the sights—alteration then being made to apply the fire to the target.

2. **Explain :—**Observation of fire is far more easily obtained from the LMG, because of its closer grouping, than from riflemen. The rule is, therefore, that the fire of the LMG should be used as the basis of applying fire by observation, rather than that of the riflemen.

**Demonstration :—** This is given, firing at a ground target, with

- (i) LMG,
- (ii) Riflemen

3. **Explain :—**The extent to which observation is possible will depend largely on the nature of the ground and training of the men, particularly that of the section commander, the Bren firer and the No. 2. It is easy to obtain on dry plough, sand, water and grassland when the grass is short and the ground dry. Observation will be difficult in wet or long grassland, wet plough, crops, etc.

**Demonstration :—** Given with LMG on such types of ground as are available.

### 4. Explain :—

(a) The principle in applying fire by observation is that the centre of the beaten zone is applied to the target. Thus, if shots are observed to be striking both short of and beyond the target, it may be assumed that the beaten zone is correctly applied. (See also paragraph 7 on page 36).

**Demonstration :—** Given with LMG on ground target.

(b) The beaten zone will almost invariably have a few wide shots around its edge. Care must be taken, therefore, not to take the strike of single bullets as showing the centre of the beaten zone; if the ground would show the strike of one bullet it would show more if they were there.

5. **Explain :—**Alterations in sight adjustment must always be made boldly, and normally never less than 100 yards at a time. This rule is especially important when applying fire to a forward slope, when an alteration of 100 yards will lift the beaten zone a few feet only. Moreover, the length of the beaten zone is automatically foreshortened on rising ground. There is not, therefore, the same margin of latitude available.

**Demonstration :—** This is given with LMG, on both level ground and forward slopes if possible. A stop butt may be used as a forward slope.

6. **Explain :—**Should observation be unobtainable, the best method is to bring the sights well down and try to get observation at some point nearer than the target, thereafter applying the beaten zone on to the target by observation, if possible, or failing that, by estimation.

**Demonstration :—** Given with LMG.



**7. Explain :—**It must be realised that on level ground the target may be included in the danger zone and not necessarily in the beaten zone. Provided that the ground is fairly level, the target fairly high (*i.e.*, men walking) and the range not greater than about 600 yards, generally it will be best to apply the beaten zone **beyond the actual target** in order to get the maximum effect from the bullets. This fact is not normally appreciated in fire control.

**Demonstration :—** Given with LMG, using tracer if available. Failing this, targets should be placed out to show trajectories of bullets. Spectators should be on a flank between the LMG and the near end of the beaten zone.

**Ranging.—**

**8. Explain :—**The term "ranging" implies ascertaining the range to a probable target, *e.g.*, a gap the enemy must pass, **before** they are actually seen. While it ensures that when the enemy appears the greatest possible fire effect will be instantly produced, this advantage must be balanced against the disadvantage of the probable loss of surprise effect.

**Demonstration :—** Given with LMG—bringing up surprise targets on completion of ranging





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